WHAT IS CLAIMED IS:

1. A method of recovering symbol synchronization for a serial transmission, the method comprising the steps of:

obtaining in-phase and quadrature components of a received digital bitstream, the components including a pilot bitstream embedded therein;

storing a copy of the obtained in-phase and quadrature components;

recovering a version of the pilot bitstream from the obtained components;

computing a correlator output to provide a timing correction factor;

applying the timing correction factor to the stored copy of the received components to adjust the symbol timing of the received bitstream; and,

recovering another version of the pilot bitstream from the copy of the received bitstreams based on the adjusted symbol timing.

2. A method for recovering symbol synchronization as recited in claim 1, wherein the step of computing a correlator output includes:

digitally filtering a received digital bitstream with the spectrum of a pre-determined pilot signal to recover the in-phase component;

digitally filtering the quadrature received digital bitstream with the spectrum of the pre-determined pilot signal to recover the quadrature component;

computing the absolute values of the in-phase and the quadrature-phase components and forming a sum thereof, the sum being the correlator output; and

comparing the correlator output to a predefined threshold and periodical characteristics, and upon favorable comparison, the pilot is considered as detected.

3. A method for recovering symbol synchronization as recited in claim 1, wherein the step of computing a correlator output includes processing the data through an equalizer which is trained by the output of the correlator to assist in the detection of the pilot signal and recover the timing.

4. A method for recovering symbol synchronization as recited in claim 1 wherein the step of recovering includes down sampling the recovered components data from Ts/M to Ts/N.

5. A method for recovering symbol synchronization as recited in claim 4 wherein the step of recovering further includes processing the recovered components data through a fast equalizer and providing the correlator output as feedback to the fast equalizer.

6. A method for recovering symbol synchronization as defined in claim 1wherein the pilot signal is at least 16 symbols in length having broad spectrum coverage and high AC energy.

7. A method for recovery symbol synchronization as defined in claim 6 wherein the pilot signal is a waveform created from a modified BARC code.

8. A method for recovery symbol synchronization as defined in claim 7 wherein the pilot signal is a waveform having at least a pattern for a first polarity of four high values in the first four symbols, three low values in the subsequent three symbols, two high values in the next subsequent symbols, and alternating low and high values in the remaining seven symbols.

9. A method for recovery symbol synchronization as defined in claim 1 wherein the pilot bitstream is transmitted using Differential Phase Shift Keying and sync and data fields of the digital bit stream are transmitted using Quadrature Amplitude Modulation.

10. A fast symbol timing recovery system comprising:

means for receiving a broadband signal input including a pilot bitstream;

means for demodulating and adjusting gain connected to the receiving means and providing as an output in-phase and quadrature components of the signal input;

means for storing the in-phase and quadrature components;

means for recovering the pilot bitstream from the stored components; and,

a correlator for computing a timing correction factor to the stored copy of the received components based on the pilot bitstream to adjust the symbol timing of the received bitstream, the correction factor applied to the recovering means for subsequent reading of the stored components.

11. A fast symbol timing recovery system as defined in claim 10 wherein the recovering means comprises an interpolator down sampling the in-phase and quadrature components from Ts/M to Ts/N and a fast equalizer processing the down sampled components to the correlator.

12. A fast symbol timing recovery system as defined in claim 10 wherein the correlator includes

means for digitally filtering a received digital bitstream with the spectrum of the pre-determined pilot signal to recover the in-phase component;

means for digitally filtering the quadrature received digital bitstream with the spectrum of the pre-determined pilot signal to recover the quadrature component;

means for computing the absolute values of the in-phase and the quadrature-phase components and forming a sum thereof, the sum being the correlator output; and

means for comparing the correlator output to a predefined threshold and periodical characteristics, and upon favorable comparison, providing a pilot detected signal.

13. A fast symbol timing recovery system as defined in claim 10 wherein the pilot bit stream comprises 16 symbols having broad spectrum coverage and high AC energy.

14. A fast symbol timing recovery system as defined in claim 13 wherein the pilot is a waveform created from a modified BARC code.

15. A fast symbol timing recovery system as defined in claim 14 wherein the pilot is a waveform having a pattern for a first polarity of four high values in the first four symbols, three low values in the subsequent three symbols, two high values in the next subsequent symbols, and alternating low and high values in the remaining seven symbols.

16. A fast symbol timing recovery system as defined in claim 12. wherein the pilot bitstream comprises at least one first bitsrream and a second bitstream the second bitstream substantially a mirror image of the first bitstream.

17. A fast symbol timing recovery system as defined in claim 16 wherein the pilot is a waveform having a pattern for a first polarity of four high values in the first four symbols, three low values

in the subsequent three symbols, two high values in the next subsequent symbols, and alternating low and high values in seven symbols followed by a mirror image pattern for a first polarity of alternating low and high values in seven symbols followed by two high values in the next subsequent symbols, three low values in the subsequent three symbols and four high values in the final four symbols .

18. A method for recovery symbol synchronization as defined in claim 2 wherein the pilot signal comprises at least one first bitstream and a second bitstream the second bitstream substantially a mirror image of the first bitstream.

19. A method for recovery symbol synchronization as defined in claim 18 wherein the pilot is a waveform having a pattern for a first polarity of four high values in the first four symbols, three low values in the subsequent three symbols, two high values in the next subsequent symbols, and alternating low and high values in seven symbols followed by a mirror image pattern for a first polarity of alternating low and high values in seven symbols followed by two high values in the next subsequent symbols, three low values in the subsequent three symbols and four high values in the final four symbols .